Phase I Report - February 1973 - March 1973

EVALUATION OF ERTS DATA FOR CERTAIN HYDROLOGICAL USES

Principal Investigator Donald R. Wiesnet

Coinvestigator David F. McGinnis

NOAA/NESS/ESG
Suite 300, 3737 Branch Avenue
Washington, D. C. 20031

ERTS Proposal NASA No. 109

GSFC ID No. C0313

Task No. 432-641-14-04-03

Objective:

The overall objective of this investigation is to evaluate ERTS data for hydrologic information in two areas in which extensive ground truth is available.

a. Sierra Nevada studies.--Here the objective is to evaluate ERTS data from a mountainous region with extensive ground truth and where a prolonged melting snowpack is the primary source of surface runoff to a highly managed river system. To determine--by comparing satellite and ground truth data--the feasibility of indirect quantitative assessments of water storage in reservoirs and possibly in the snowpack as snow. Snow mapping in mountainous terrain is an extremely challenging task.

b. Lake Ontario (IFYGL) studies: Here the objective is to assess in a quantitative way, the ERTS data from a temperate region lake and from its drainage basin, in terms of hydrologic information content, relating ground truth to spectral band, ground resolution, etc. Coincident use of ITOS-D imagery and data will permit evaluation of the effect of the 18-day revisit cycle on hydrologic phenomenologic monitoring.

Summary:

a. Sierra Nevada.--

Mosaicing of U-2 imagery taken of the Feather River on March 6, 1972 (Flight No. 72-036) has been completed. Ground truth corresponding to the flight data arrived during the report period and is being studied. Our request for ERTS imagery of the Sierra Nevada finally reached the GSFC system. To date, imagery of the Feather River for three ERTS passes (11/29, 1/4, 1/22) has been received and analyzed for basin snow cover. Ground truth to coincide with all ERTS passes over the Feather River are being sent to us by the River Forecast Center at Sacramento, Calif.

b. Lake Ontario.--

Thermal imagery of the Scipio-Fleming test site from the Daedalus Corporation has been received. Part of the multispectral data (photography and ground measurements) Data Corp. of the Scipio-Fleming and Lake Ontario test sites have been received. Reduction of the data is continuing.

ERTS-1 imagery and NOAA-2 imagery of ice breakup on Lake Erie on Feb. 18, 1973, were almost coincident. From these two sets of images we have been able to ascertain that the ground resolution of NOAA-2 visible band imagery is at least 0.6 km with a high contrast linear target. The concurrent thermal image of NOAA-2 (10.5-12.5μm) corroborates the interpretation of how the ice formed and the inferred age of the ice.

Work Plans:

A comparison of ERTS and NOAA-2 snow maps over the entire Lake Ontario basin will be attempted. ERTS digital data over the L. Oneida test site (11 Oct 1972) will be analyzed for the spectral variations associated with land use vegetation, and seasonal changes.